Ecological site R231XY152AK
High-elevation scrub gravelly drainageways

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 231X–Interior Alaska Highlands

The Interior Alaska Uplands (MLRA 231X) is in the Interior Region of Alaska and includes the extensive hills, mountains, and valleys between the Tanana River to the south and the Brooks Range to the north. These hills and mountains surround the Yukon Flats Lowlands (MLRA 232X). MLRA 231X makes up about 69,175 square miles. The hills and mountains of the area tend to be moderately steep to steep resulting in high-relief slopes. The mountains are generally rounded at lower elevations and sharp-ridged at higher elevations. Elevation ranges from about 400 feet in the west, along the boundary with the Interior Alaska Lowlands (MLRA 229X), to 6,583 feet at the summit of Mt. Harper, in the southeast. Major tributaries include large sections of the Yukon, Koyukuk, Kanuti, Charley, Coleen, and Chatanika Rivers. This area is traversed by several major roads, including the Taylor Highway in the east and the Steese, Elliott, and Dalton Highways north of Fairbanks. The area is mostly undeveloped wild land that is sparsely populated. The largest community along the road system is Fairbanks with smaller communities like Alatna, Allakaket, Chicken, Eagle, Eagle Village, Hughes, and Rampart occurring along the previously mentioned rivers and highways.

The vast majority of this MLRA was unglaciated during the Pleistocene epoch with the exceptions being the highest mountains and where glaciers extended into the area from the Brooks Range. For the most part, glacial moraines and drift are limited to the upper elevations of the highest mountains. Most of the landscape is mantled with bedrock colluvium originating from the underlying bedrock. Valley bottoms are filled with Holocene fluvial deposits and colluvium from the adjacent mountain slopes. Silty loess, which originated from unvegetated flood plains in and adjacent to this area, covers much of the surface. On hill and mountain slopes proximal to major river valleys (e.g., Tanana and Yukon Rivers), the loess is many feet thick. As elevation and distance from major river valleys increases, loess thickness decreases significantly. Bedrock is commonly exposed on the highest ridges.

This area is in the zone of discontinuous permafrost. Permafrost commonly is close to the surface in areas of the finer textured sediments throughout the MLRA. Isolated masses of ground ice occur in thick deposits of loess on terraces and the lower side slopes of hills. Solifluction lobes, frost boils, and circles and stripes are periglacial features common on mountain slopes in this area. Pingos, thermokarst pits and mounds, ice-wedge polygons, and earth hummocks are periglacial features common on terraces, lower slopes of hills and mountains, and in upland valleys in the area.

The dominant soil orders in this area are Gelisols, Inceptisols, Spodosols, and Entisols. The soils in the area have a subgelic or cryic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. Gelisols are common on north facing slopes, south facing footslopes, valley bottoms, and stream terraces. Gelisols are typically shallow or moderately deep to permafrost (10 to 40 inches) and are poorly or very poorly drained. Wildfires can disturb the insulating organic material at the surface, lowering the permafrost layer, eliminating perched water tables from Gelisols, and thus changing the soil classification. Inceptisols and Spodosols commonly form on south facing hill and mountain slopes. Entisols are common on flood plains and high elevation mountain slopes. Miscellaneous (non-soil) areas make up about 2 percent of this MLRA. The most common miscellaneous areas are rock outcrop and rubble land. In many valleys placer mine tailings are common.

Short, warm summers and long, cold winters characterize the subarctic continental climate of the area. The mean annual temperature of the area ranges from 22 to 27 degrees F. The mean annual temperature of the southern half of the area is approximately 3 degrees warmer compared to the northern half (PRISM 2018). The warmest months span June through August with mean monthly temperatures ranging from 50 to 56 degrees F. The coldest months span November through February with mean monthly temperatures ranging from -5 to 3 degrees F. When compared to the high-elevation alpine and subalpine life zones, the lower elevation boreal life zone tends to be 2-3 degrees F colder during the coldest months and 1-2 degrees F warmer during the warmest months (PRISM 2018). The freeze-free period at the lower elevations averages about 60 to 100 days, and the temperature usually remains above freezing from June through mid-September.

Precipitation is limited across this area, with the average annual precipitation ranging from 12 to 19 inches. The southern half of the areas receives approximately 2.5 inches more annual precipitation then the northern half (PRISM 2018). The lower elevation boreal life zone receives approximately 2.5 inches less annual precipitation than the high-elevation alpine and subalpine life zones (PRISM 2018). Approximately 3/5th of the annual precipitation occurs during the months of June through September with thunderstorms being common. The average annual snowfall ranges from about 45 to 100 inches. The ground is consistently covered with snow from November through March.

Most of this area is forested below an elevation of about 2500 feet. Dominant tree species on slopes are white spruce and black spruce. Black spruce stands are most common on north-facing slopes, stream terraces, and other sites with poor drainage and permafrost. White spruce stands are most common on warm slopes with dry soils. At lower elevations, lightning-caused wildfires are common, often burning many thousands of acres during a single fire. Following wildfires, forbs, grasses, willow, ericaceous shrubs, paper birch, and quacking aspen communities are common until they are eventually replaced by stands of spruce. Tall willow and alder scrub is extensive on low flood plains. White spruce and balsam poplar are common on high flood plains.

With increasing elevation, the forests and woodlands give way to subalpine communities dominated by krummholz spruce, shrub birch, willow, and ericaceous shrubs. At even higher elevations, alpine communities prevail which are characterized by diverse forbs, dwarf ericaceous shrubs, and eightpetal mountain-avens. Many of these high elevation communities have a considerable amount of lichen cover and bare ground.

LRU notes

This area supports three life zones defined by the physiological limits of plant communities along an elevational gradient: boreal, subalpine, and alpine. The boreal life zone is the elevational band where forest communities dominate. Not all areas in the boreal life zone are forest communities, however, particularly in places with too wet or dry soil to support tree growth (e.g., bogs or river bluffs). Above the boreal band of elevation, subalpine and alpine vegetation dominate. The subalpine zone is typically a narrow transitional band between the boreal and the alpine life zones, and is characterized by sparse, stunted trees. In the subalpine, certain types of birch and willow shrub species grow at ≥ 1 m in height (commonly *Betula glandulosa* and Salix pulchra). In the alpine, trees no longer occur, and all shrubs are dwarf or lay prostrate on the ground. In this area, the boreal life zone occurs below 2500 feet elevation on average. The transition between boreal and alpine vegetation can occur within a range of elevations, and is highly dependent on slope, aspect, and shading from adjacent mountains.

Within each life zone, there are plant assemblages that are typically associated with cold slopes and warms slopes. Cold slopes and warm slopes are created by the combination of the steepness of the slope, the aspect, and shading from surrounding ridges and mountains. Warm slope positions typically occur on southeast to west facing slopes that are moderate to very steep (>10% slope) and are not shaded by the surrounding landscape. Cold slopes typically occur on northwest to east facing slopes, occur in shaded slope positions, or occur in low-lying areas that are cold air sinks. Examples of shaded positions include head slopes, low relief backslopes of hills, and the base of hills and mountains shaded by adjacent mountain peaks. Warm boreal slope soils have a cryic soil temperature regime and lack permafrost. In this area, white spruce forests are an indicator of warm boreal slopes. Cold boreal slope soils typically have a gelic soil temperature regime and commonly have permafrost. In this area, black spruce forests and woodlands are an indicator of cold boreal slopes. The boreal life zone can occur at higher elevations on warm slopes, and lower elevations on cold slopes.

Classification relationships

Landfire BPS - 7416371 – Western North American Boreal Alpine Floodplain – Lower Elevations

Ecological site concept

This drainageway site occurs in the subalpine and alpine life zones and has moist and gravelly soils without permafrost. These drainageways are relatively small, roughly linear depressions that move concentrated water throughout the growing season and have a small defined channel. Some may be considered low-order streams. In this area, the soils directly adjacent to the small defined channel of a drainageway typically have minimal to no bare alluvium, which significantly differs from flood plain systems. Given their limited footprint, drainageways have a narrow band of associated vegetation. Associated soils do not typically pond but occasionally flood, have a high-water table during long portions of the growing season, and are typically considered poorly drained. The soils formed in gravelly alluvium.

The alpine and subalpine life zones have a harsh climate that limits growth of vegetation and prevents the establishment of many species common at lower elevations. The high-elevation vegetation associated with this site is the result of high winds, a short growing season, deep and persistent snow beds, and cold soils. These climatic factors prevent the establishment and growth of many dominant boreal species like white spruce and black spruce.

Two plant communities occur within the reference state and the vegetation in each plant community differs in large part due to flooding. As flooding frequency and duration decreases, willow height and cover increases. Given this observation, a more frequently and severely flooded plant community was incorporated into the reference state (community 1.2).

For this site, the reference plant community has the least frequent and shortest duration flood events. This community is characterized as open tall scrub (Viereck et al. 1992) with dominant overstory vegetation being feltleaf willow and tealeaf willow. Other common species include scrub birch, shrubby cinquefoil, bluejoint, shortstalk sedge, tall bluebells, larkspurleaf monkshood, Tilesius' wormwood, fireweed, ledge stonecrop, arctic dock, Schreber's big red stem moss, and splendid feathermoss.

Associated sites

R231XY101AK	**Alpine dwarf scrub gravelly slopes** Occurs upslope on dry soils in the alpine.
R231XY148AK	**Subalpine Scrub Gravelly Slopes Moist** This site commonly occurs directly adjacent to site 152 on the base of hills and mountains in the subalpine life zone. Site 148 is situated on cold slopes with wet and frozen soils.
R231XY164AK	**Subalpine Scrub Gravelly Slopes Dry** Occurs upslope on dry soils in the subalpine.
R231XY185AK	**Subalpine Scrub Loamy Frozen Footslopes** This site commonly occurs directly adjacent to site 185 on the base of hills and mountains in the subalpine life zone. Site 185 is situated on warm slopes with moist and gravelly soils.

Similar sites

R231XY191AK	**Boreal Scrubland Gravelly Drainageways Wet** Site 191 is a shrubby drainageway site that occurs in the boreal life zone. Sites 152 and 191 have different kinds and amounts of vegetation.
F231XY193AK	**Boreal Woodland Loamy Frozen Drainageways** Site 193 is a forested drainageway site that occurs in the boreal life zone. Sites 152 and 193 have different kinds and amounts of vegetation.
R231XY195AK	**Boreal Scrubland Gravelly Drainageways Steep** Site 195 is a shrubby drainageway site that occurs in the boreal life zone. Sites 152 and 195 have different kinds and amounts of vegetation.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Salix alaxensis* (2) *Salix pulchra*
Herbaceous	(1) *Mertensia paniculata* (2) *Aconitum delphiniifolium*

Physiographic features

This site occurs at high elevation on drainageways in the mountains. Elevation typically ranges between 2500 and 4100 feet but at times goes as low as 1800 feet on cold northerly slopes. This site typically occurs on gentle slopes but at times certain drainageways range up to 15 percent or more. Associated drainageways occur on all slope aspects. Ponding does not occur. Flooding occurs occasionally for brief durations of time. During the growing season, the water table typically occurs 5 to 10 inches below the soil surface. This site generates very limited runoff to adjacent, downslope ecological sites.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Mountains > Drainageway
Runoff class	Very low to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	2,500–4,100 ft
Slope	2–8%
Water table depth	8–10 in
Aspect	W, NW, N, NE, E, SE, S, SW

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	Not specified
Elevation	1,800–4,450 ft
Slope	0–20%
Water table depth	0–10 in

Climatic features

When compared to the boreal life zone, this high-elevation site has a harsh climate. In this MLRA, snow first blankets and persists the longest in the alpine and subalpine life zones. From spring through fall (April through September) , it is consistently 1 to 2 degrees F colder in the alpine and subalpine. These small differences in temperature are exacerbated due to constant and strong winds. Winds are much more intense in these high elevation areas because of limited trees providing windbreaks. When compared to the boreal life zone, this site has a much shorter growing season and the growing season is significantly colder for associated vegetation.

Short, warm summers and long, cold winters characterize the subarctic continental climate associated with this high-elevation site. The mean annual temperature of the site ranges from 23 to 27 degrees F. The warmest months span June through August with mean normal maximum monthly temperatures ranging from 57 to 63 degrees F. The

coldest months span November through February with mean normal minimum temperatures ranging from -9 to -1 degrees F. The freeze-free period for the site ranges from 80 to 120 days, and the temperature usually remains above freezing from late May through mid-September.

The area receives minimal annual precipitation with the summer months being the wettest. Average annual precipitation in the alpine across the area typically ranges between 14 to 21 inches. Approximately 3/5th of the annual precipitation occurs during the months of June through September with thunderstorms common. The average annual snowfall ranges from about 45 to 100 inches. The ground is consistently covered with snow from mid-October through March.

Table 4. Representative climatic features

Frost-free period (characteristic range)	16-78 days
Freeze-free period (characteristic range)	76-114 days
Precipitation total (characteristic range)	14-21 in
Frost-free period (actual range)	4-87 days
Freeze-free period (actual range)	48-120 days
Precipitation total (actual range)	10-25 in
Frost-free period (average)	53 days
Freeze-free period (average)	90 days
Precipitation total (average)	17 in

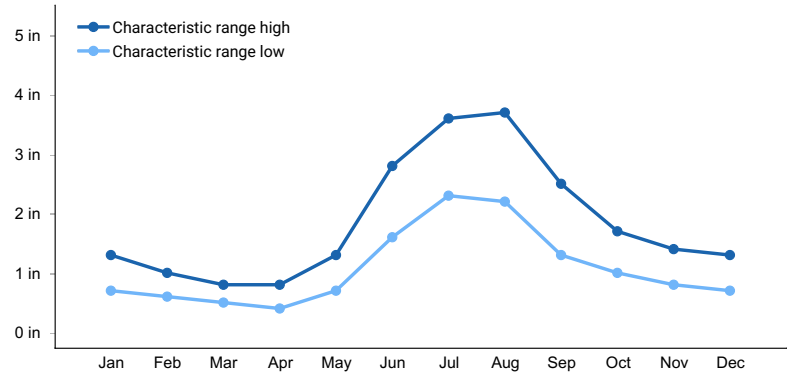


Figure 1. Monthly precipitation range

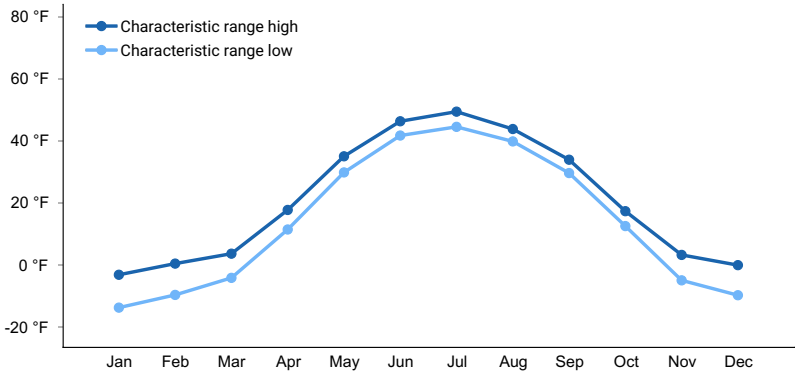


Figure 2. Monthly minimum temperature range

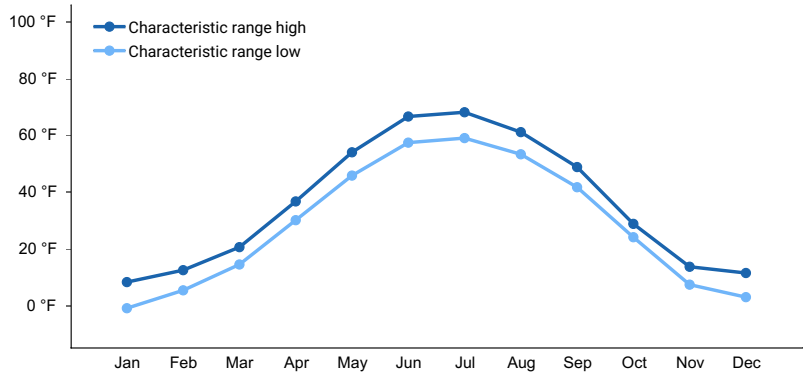


Figure 3. Monthly maximum temperature range

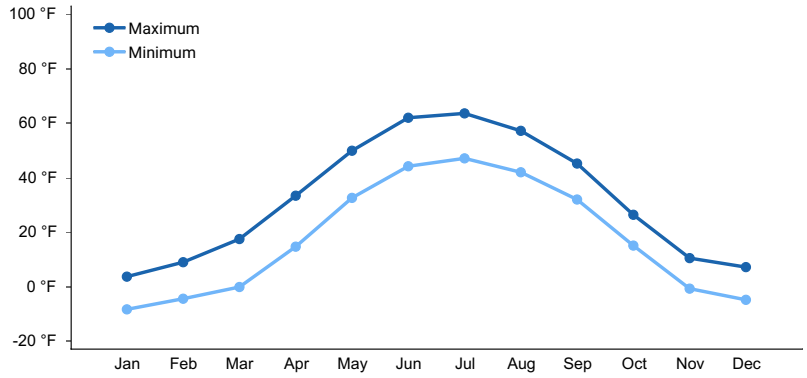


Figure 4. Monthly average minimum and maximum temperature

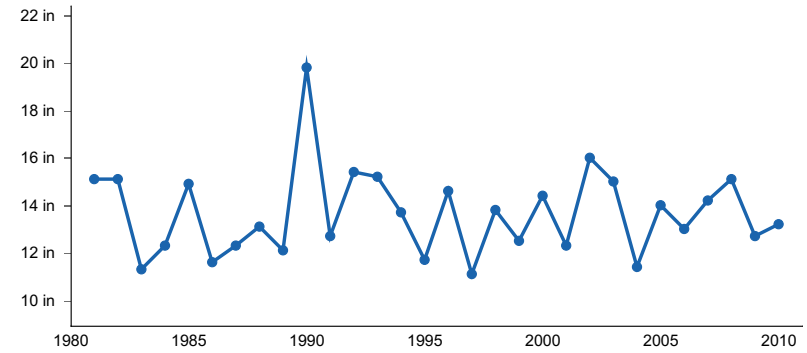


Figure 5. Annual precipitation pattern

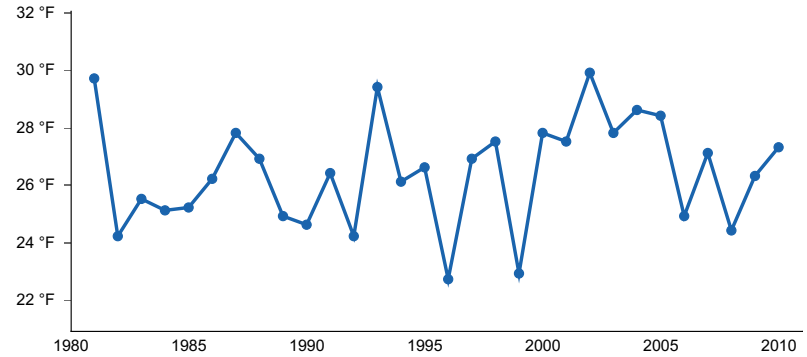


Figure 6. Annual average temperature pattern

Climate stations used

- (1) EAGLE AP [USW00026422], Tok, AK
- (2) CHICKEN [USC00501684], Tok, AK
- (3) MILE 42 STEESE [USC00505880], Fairbanks, AK

- (4) BETTLES AP [USW00026533], Bettles Field, AK
- (5) CIRCLE HOT SPRINGS [USC00501987], Central, AK
- (6) FT KNOX MINE [USC00503160], Fairbanks, AK
- (7) GILMORE CREEK [USC00503275], Fairbanks, AK
- (8) FOX 2SE [USC00503181], Fairbanks, AK
- (9) ESTER DOME [USC00502868], Fairbanks, AK
- (10) ESTER 5NE [USC00502871], Fairbanks, AK
- (11) COLLEGE 5 NW [USC00502112], Fairbanks, AK
- (12) COLLEGE OBSY [USC00502107], Fairbanks, AK
- (13) KEYSTONE RIDGE [USC00504621], Fairbanks, AK

Influencing water features

This site is primarily classified as a slope wetland under the Hydrogeomorphic (HGM) classification system (Smith et al. 1995; USDA-NRCS 2008) but might share similarities with some riverine wetland systems. In the associated drainageways, groundwater return flow, interflow from surrounding uplands, and precipitation are considered the main sources of water (Smith et al. 1995).

Depth to the water table may decrease following summer storm events or spring snowmelt and increase during extended dry periods.

Wetland description

n/a

Soil features

Soils formed in silty and gravelly alluvium and do not have permafrost. Surface rock fragment are variable with drainageways that flood most intensely having up to 35 percent fragments on the soil surface. These are mineral soils often capped with 2 to 7 inches of organic material. The mineral soil below the organic material is often loamy, which typically lacks rock fragments and has high water holding capacity. The thickness of the loamy alluvium is highly variable and ranges from 0 to 25 inches. Below the loamy alluvium is gravelly alluvium with rock fragments that commonly range between 10 and 30 percent of the soil profile by volume. These soils are very deep without restrictions. The pH of the soil profile is highly variable typically ranging from very strongly acidic to neutral. The soils are wet for long portions of the growing season and are poorly drained.

Figure 7. A typical soil profile associated with this site.

Table 5. Representative soil features

Parent material	(1) Alluvium

Surface texture	(1) Stony silt loam (2) Very fine sandy loam (3) Peat
Family particle size	(1) Sandy-skeletal (2) Coarse-loamy over sandy or sandy-skeletal (3) Coarse-loamy
Drainage class	Poorly drained
Permeability class	Moderately rapid
Soil depth	60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	1.4–2.3 in
Calcium carbonate equivalent (10-40in)	0%
Clay content (0-20in)	2–5%
Electrical conductivity (10-40in)	0–3 mmhos/cm
Sodium adsorption ratio (10-40in)	0
Soil reaction (1:1 water) (10-40in)	4.5–7
Subsurface fragment volume <=3" (0-60in)	10–25%
Subsurface fragment volume >3" (0-60in)	0–5%

Table 6. Representative soil features (actual values)

Drainage class	Not specified
Permeability class	Not specified
Soil depth	Not specified
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0–25%
Available water capacity (0-40in)	1.4–7.2 in
Calcium carbonate equivalent (10-40in)	Not specified
Clay content (0-20in)	Not specified
Electrical conductivity (10-40in)	Not specified
Sodium adsorption ratio (10-40in)	Not specified
Soil reaction (1:1 water) (10-40in)	4.5–8
Subsurface fragment volume <=3" (0-60in)	5–45%

Subsurface fragment volume >3" (0-60in)	0–30%

Ecological dynamics

Climate

Located in the alpine and subalpine life zones, this site is exposed to a variety of harsh environmental conditions. Compared to the boreal life zone, snowpack tends to be deeper and persist for longer durations of time at high elevation. As a result, subalpine and alpine vegetation has a comparatively shorter season to grow and reproduce. When this site is snow-free, cold temperatures and high winds also inhibit plant growth and performance. This harsh climate maintains vegetation within this site and prevents the establishment and/or growth of dominant boreal species like black spruce and white spruce.

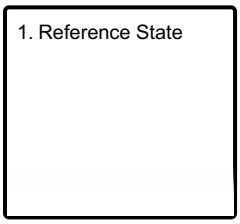
Separate alpine and subalpine drainageway concepts were not developed for this area because the size, structure, and composition of vegetation appeared to remain constant across both life zones. Future targeted data collection may result in splitting this drainageway site between alpine and subalpine life zones.

Flooding

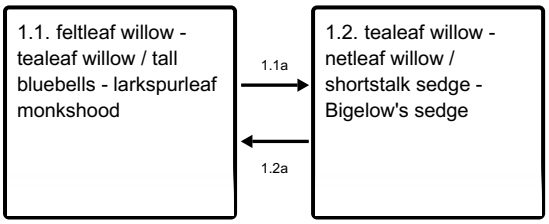
Field work indicates that certain sampled communities within the reference state flood more frequently and/or severely then other communities. As flooding frequency and duration decreases, willow height and cover increases. Given this observation, a more frequently and severely flooded plant community was incorporated into the reference state (community 1.2). These plant communities represent the successional transition from river wash to the reference plant community (community 1.1).

State and transition model

Ecosystem states



State 1 submodel, plant communities



1.1a - More frequent and longer duration flooding

1.2a - Less frequent and shorter duration flooding

State 1
Reference State

Figure 8. A shrubby community associated with this subalpine site.

Two plant communities occur within the reference state and the vegetation differs in large part due to flooding. For this site, plant community 1.1 has the least frequent and shortest duration flood events. This community is characterized as open tall scrub (Viereck et al. 1992) with the dominant overstory vegetation being being feltleaf willow and tealeaf willow.

Dominant plant species

- feltleaf willow (*Salix alaxensis*), shrub
- tealeaf willow (*Salix pulchra*), shrub
- tall bluebells (*Mertensia paniculata*), other herbaceous
- larkspurleaf monkshood (*Aconitum delphiniifolium*), other herbaceous

Community 1.1
feltleaf willow - tealeaf willow / tall bluebells - larkspurleaf monkshood

Figure 9. A typical plant community associated with community 1.1.

The reference plant community is characterized as open tall scrub (Viereck et al. 1992) with dominant overstory vegetation being feltleaf willow and tealeaf willow. White spruce are occasionally present but with limited cover. Other common species include scrub birch (*Betula glandulosa*), shrubby cinquefoil, bluejoint, shortstalk sedge, tall bluebells, larkspurleaf monkshood, Tilesius' wormwood, fireweed, ledge stonecrop, arctic dock, Schreber's big red stem moss, and splendid feathermoss. The soil surface is primarily covered with herbaceous litter, surface rock fragments, and moss. This site typically has a distinct channel with flowing water (as much as 15 percent of the plot). The vegetative strata that characterize this community are tall shrubs (greater than 10 feet), medium shrubs (between 3 and 10 feet), and medium forbs (between 4 and 24 inches).

Forest understory. The tall scrub canopy was occasionally over 75 percent cover. In these instances, community 1.1 was classified as closed tall scrubland.

Dominant plant species

- feltleaf willow (*Salix alaxensis*), shrub
- tealeaf willow (*Salix pulchra*), shrub
- shrubby cinquefoil (*Dasiphora fruticosa*), shrub
- resin birch (*Betula glandulosa*), shrub
- bluejoint (*Calamagrostis canadensis*), grass
- shortstalk sedge (*Carex podocarpa*), grass
- splendid feather moss (*Hylocomium splendens*), other herbaceous
- tall bluebells (*Mertensia paniculata*), other herbaceous
- larkspurleaf monkshood (*Aconitum delphiniifolium*), other herbaceous
- Schreber's big red stem moss (*Pleurozium schreberi*), other herbaceous
- Tilesius' wormwood (*Artemisia tilesii*), other herbaceous
- fireweed (*Chamerion angustifolium*), other herbaceous
- ledge stonecrop (*Rhodiola integrifolia*), other herbaceous
- arctic dock (*Rumex arcticus*), other herbaceous

Community 1.2
tealeaf willow - netleaf willow / shortstalk sedge - Bigelow's sedge

Figure 10. A typical plant community associated with community 1.2.

The reference plant community is characterized as open low scrub (Viereck et al. 1992). Common species include feltleaf willow, tealeaf willow, scrub birch (*Betula glandulosa*), shrubby cinquefoil, bog blueberry, netleaf willow, eightpetal mountain-avens, shortstalk sedge, Bigelow's sedge, Altai fescue, various bluegrass, and Schreber's big red stem moss. The vegetative strata that characterize this community are low shrub (between 8 and 36 inches), dwarf shrubs (less than 8 inches), and medium graminoids (between 4 and 24 inches). This site typically has a distinct channel with flowing water (as much as 30 percent of the plot). Areas of bare soil with surface rock fragments are extensive (up to 90 percent of the plot). When not bare, the soil surface is primarily covered with herbaceous litter and moss.

Dominant plant species

- tealeaf willow (*Salix pulchra*), shrub
- feltleaf willow (*Salix alaxensis*), shrub
- shrubby cinquefoil (*Dasiphora fruticosa*), shrub
- netleaf willow (*Salix reticulata*), shrub
- resin birch (*Betula glandulosa*), shrub
- bog blueberry (*Vaccinium uliginosum*), shrub
- black crowberry (*Empetrum nigrum*), shrub
- eightpetal mountain-avens (*Dryas octopetala ssp. octopetala*), shrub
- Alaskan mountain-avens (*Dryas octopetala ssp. alaskensis*), shrub
- lingonberry (*Vaccinium vitis-idaea*), shrub
- shortstalk sedge (*Carex podocarpa*), grass
- Bigelow's sedge (*Carex bigelowii*), grass

- Altai fescue (*Festuca altaica*), grass
- bluegrass (*Poa*), grass
- water sedge (*Carex aquatilis*), grass
- Schreber's big red stem moss (*Pleurozium schreberi*), other herbaceous
- Alaska springbeauty (*Claytonia sarmentosa*), other herbaceous
- western arctic shootingstar (*Dodecatheon frigidum*), other herbaceous
- splendid feather moss (*Hylocomium splendens*), other herbaceous
- boreal sagebrush (*Artemisia arctica*), other herbaceous
- Richardson's brookfoam (*Boykinia richardsonii*), other herbaceous
- dwarf fireweed (*Chamerion latifolium*), other herbaceous
- tall bluebells (*Mertensia paniculata*), other herbaceous
- alpine mountainsorrel (*Oxyria digyna*), other herbaceous
- meadow bistort (*Polygonum bistorta*), other herbaceous
- ledge stonecrop (*Rhodiola integrifolia*), other herbaceous

Pathway 1.1a
Community 1.1 to 1.2

feltleaf willow - tealeaf willow / tall bluebells - larkspurleaf monkshood

tealeaf willow - netleaf willow / shortstalk sedge - Bigelow's sedge

More frequent and longer duration high-water and/or flooding events that scour the soils in the drainageway.

Pathway 1.2a
Community 1.2 to 1.1

tealeaf willow - netleaf willow / shortstalk sedge - Bigelow's sedge

feltleaf willow - tealeaf willow / tall bluebells - larkspurleaf monkshood

Less frequent and shorter duration high-water and/or or flooding events that scour the soils in the drainageway.

Additional community tables

Table 7. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)
Tree							
white spruce	PIGL	*Picea glauca*	Native	–	0–1	–	–

Table 8. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
bluejoint	CACA4	*Calamagrostis canadensis*	Native	2–4	0–25
shortstalk sedge	CAPO	*Carex podocarpa*	Native	2–4	0–15
hair-like sedge	CACA12	*Carex capillaris*	Native	0.3–2	0–15
Altai fescue	FEAL	*Festuca altaica*	Native	2–4	0–5
bluegrass	POA	*Poa*	Native	0.3–2	0–3
Forb/Herb					
tall bluebells	MEPA	*Mertensia paniculata*	Native	0.3–2	0–10
arctic dock	RUAR6	*Rumex arcticus*	Native	0.3–2	0–10
Tilesius' wormwood	ARTI	*Artemisia tilesii*	Native	2–4	0–10
ledge stonecrop	RHIN11	*Rhodiola integrifolia*	Native	0.3–2	0–8
fireweed	CHAN9	*Chamerion angustifolium*	Native	2–4	0–7
larkspurleaf monkshood	ACDE2	*Aconitum delphiniifolium*	Native	2–4	0.1–6
dwarf fireweed	CHLA13	*Chamerion latifolium*	Native	0.3–2	0–5
alpine sweetvetch	HEAL	*Hedysarum alpinum*	Native	0.3–2	0–5
merckia	WIPH	*Wilhelmsia physodes*	Native	0.1–0.3	0–3
bunchberry dogwood	COCA13	*Cornus canadensis*	Native	0.1–0.3	0–3
western arctic shootingstar	DOFR	*Dodecatheon frigidum*	Native	0.1–0.3	0–2
Shrub/Subshrub					
tealeaf willow	SAPU15	*Salix pulchra*	Native	3–6	0–70
feltleaf willow	SAAL	*Salix alaxensis*	Native	8–12	0–60
grayleaf willow	SAGL	*Salix glauca*	Native	3–6	0–20
shrubby cinquefoil	DAFR6	*Dasiphora fruticosa*	Native	0.8–3	0–12
resin birch	BEGL	*Betula glandulosa*	Native	3–6	0–10
bog blueberry	VAUL	*Vaccinium uliginosum*	Native	0.8–3	0–10
black crowberry	EMNI	*Empetrum nigrum*	Native	0.1–0.3	0–1
Nonvascular					
splendid feather moss	HYSP70	*Hylocomium splendens*	Native	0.1–0.3	0–30
Schreber's big red stem moss	PLSC70	*Pleurozium schreberi*	Native	0.1–0.3	0–20

Animal community

n/a

Hydrological functions

n/a

Recreational uses

n/a

Wood products

n/a

Other products

n/a

Other information

n/a

Inventory data references

Tier 2 sampling plots used to develop the reference state. Plot numbers as recorded in NASIS with associated community phase.

Community 1.1

08TC03603, 09NP02507, 10NP02901, 2017AK290523

Community 1.2

10NP00801, 10NP00903, 10NP02403, 2017AK290522

References

Schoeneberger, P.J. and D.A. Wysocki. 2012. Geomorphic Description System. Natural Resources Conservation Service, 4.2 edition. National Soil Survey Center, Lincoln, NE.

Smith, R.D., A.P. Ammann, C.C. Bartoldus, and M.M. Brinson. 1995. An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices.

United States Department of Agriculture, . 2022. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin.

Viereck, L.A., C. T. Dyrness, A. R. Batten, and K. J. Wenzlick. 1992. The Alaska vegetation classification. U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station General Technical Report PNW-GTR-286..

Other references

Alaska Interagency Coordination Center (AICC). 2022. http://fire.ak.blm.gov/

LANDFIRE. 2009. Western North American Boreal Alpine Floodplain – Lower Elevations (Landfire 2009). In: LANDFIRE National Vegetation Dynamics Models. USDA Forest Service and US Department of Interior. Washington, DC.

PRISM Climate Group. 2018. Alaska – average monthly and annual precipitation and minimum, maximum, and mean temperature for the period 1981-2010. Oregon State University, Corvallis, Oregon. https://prism.oregonstate.edu/projects/alaska.php. (Accessed 4 September 2019).

United States Department of Agriculture-Natural Resources Conservation Service. 2016. U.S. General Soil Map (STATSGO2). Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov. Accessed (Accessed 3 March 2021).

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Approval

Kirt Walstad, 2/13/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	04/20/2024
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
